

**IN THE CLAIMS:**

1. (Canceled)
2. (Currently Amended): The method of claim ~~460~~ wherein the distance-based filter further comprises a median filter.
3. (Currently Amended): The method of claim ~~460~~ wherein the distance-based filter further comprises a low-pass filter.
4. (Currently Amended): The method of claim ~~460~~ wherein the distance-based filter further comprises one of a band-pass filter and a high-pass filter.
5. (Canceled)
6. (Currently Amended): The method of claim ~~460~~ wherein computing a locus of the samples comprises computing one of an arithmetic mean, a geometric mean, a harmonic mean, and a quadratic mean of the samples.
- 7.-8. (Canceled)
9. (Previously Presented): A method for filtering data, the method comprising:
  - receiving a plurality of data samples;
  - computing a locus of the samples by computing an average of a last three of the samples together with the input sample;
  - normalizing a value of an input sample to a range centered on the locus;
  - passing the data through a distance-based filter; and
  - normalizing an output value of the distance-based filter to a predetermined output range.

10. (Currently Amended): The method of claim 49 wherein computing a locus of the samples comprises selecting a previous filter output value.

11.-13. (Canceled)

14. (Currently Amended): A filter device, comprising:

a means for receiving a plurality of data samples;

a means for computing a locus of the samples by computing an average of a last three of the samples together with the input sample;

a means for normalizing a value of one or more of the data samples to a range centered on the locus;

a means for computing a distance between a normalized input value of the locus; and

a means for determining an output value as a function of a difference between the input value and one of the plurality of data samples.

15. (Original): The filter device of claim 14, further comprising a means for comparing the distance between the input value and the locus with a predetermined threshold value.

16. (Original): The filter device of claim 15, further comprising a means for normalizing the distance between the input value and the locus when the distance exceeds a predetermined limit.

17. (Original): The filter device of claim 16 wherein normalizing the distance between the input value and the locus includes adjusting the sample to be within one-half circle of the locus.

18. (Original): The filter device of claim 14, further comprising a means for comparing the output value with a predetermined threshold value.

19. (Original): The filter device of claim 18, further comprising a means for normalizing the output value when the output value exceeds a predetermined limit.

20. (Original): The filter device of claim 19 wherein normalizing the output value includes adjusting the output value to be within a predetermined output range.

21. (Currently Amended): A system for circular distance normalization of filtered data, the system comprising:

- a) a first memory for storing a plurality of machine instructions;
- b) a second memory for storing a plurality of data samples; and
- c) a processor coupled to the first and second memories, the processor executing the plurality of machine instructions to implement a plurality of functions, the functions including:
  - i) processing at least a portion of the plurality of data samples to compute a locus of the samples by computing an average of a last three of the samples together with the input sample;
  - ii) normalizing at least a portion of the plurality of data samples to a range centered on the locus;
  - iii) computing a distance between an input value and the locus;
  - iv) determining an output value by computing a difference between the input value and one of the plurality of data samples; and
  - v) providing the output value.

22. (Original): The system of claim 21 wherein the function of determining an output value includes applying a distance-based filter to the plurality of data samples.

23. (Original): The system of claim 21 wherein the functions executed by the processor further include normalizing the distance between the input value and the locus when the distance exceeds a predetermined threshold value.

24. (Original): The system of claim 21 wherein the functions executed by the processor further include normalizing the output value when the output value exceeds a predetermined threshold value,

25. (Original): The system of claim 21 wherein the function of processing at least a portion of the plurality of data samples to compute a locus of the samples includes computing an approximation of the locus of the samples.

26. (Original): The system of claim 25 wherein computing a locus of the samples comprises computing an average of data samples retrieved from the second memory.

27. (Original): The system of claim 21 wherein computing a locus of the samples comprises computing an average of a plurality of recent data samples.

28.-32. (Canceled)

33. (Previously Presented): A computer program product for filtering data, wherein the computer program product comprises:

a computer-readable storage medium; and

computer-readable program code means embodied in the medium, the computer-readable program code means comprising:

first computer-readable program code means for determining a locus of a received plurality of data samples by determining an average of at least a last three of the data samples together with the input sample,

second computer-readable program code means for normalizing a value of an input sample to a range centered on the locus determined from the first computer-readable program code means,  
third computer-readable program code means for distance-based filtering of the data, and  
fourth computer-readable program code means for normalizing an output value of the distance-based filter.

34. (Currently Amended): The computer program product of claim 28 33 wherein the first computer-readable program code means determines the locus of the samples by selecting a previous filter output value.

35. (Previously Presented): The computer program product of claim 33 wherein distance-based filtering of the third computer-readable program code means further comprises a median filtering.

36.-52. (Canceled)

53. (Previously Presented) The computer program product of claim 33 wherein the first computer-readable program code means for determining a locus of a received plurality of data samples further comprises computer-readable program code means for determining a locus of a received plurality of normalized data samples.

54. (Previously Presented) A method for filtering data, the method comprising:  
receiving a plurality of data samples;  
computing a locus of the samples;  
normalizing a value of an output sample to a range centered on the locus;  
passing the data through a distance-based filter;

normalizing an output value of the distance-based filter to a predetermined output range; and

limiting the normalized output value of the distance-based filter within selected limits of normalization, including adjusting the filter output value and the internal filter storage locations to remain within the selected limits of normalization.

55. (Previously Presented): The computer program product of claim 54 wherein adjusting the filter output value and the internal filter storage locations further comprises adjusting the filter output value and internal filter storage locations by plus or minus one circle.

56.-59. (Canceled)

60. (Currently Amended): ~~The method of claim 1~~ A method for filtering data, the method comprising:

receiving a plurality of data samples;

computing a locus of the samples;

initially normalizing a value of an input sample to a range centered on the locus;

after normalizing the value of the input sample, passing the data through a distance-based filter; and

normalizing an output value of the distance-based filter to a predetermined output range wherein initially normalizing a value of an input sample to a range centered on the locus further comprises selectively adapting the normalizing range as a function a range of the data samples,

wherein initially normalizing a value of an input sample to a range centered on the locus further comprises selectively adapting the normalizing range as a function a range of the data samples.